

A Bibliometric Study of Published Literature on Mizo in India using PubMed Database

Dr. TS Paumunmuang Simte

Independent Researcher

muang101simte@gmail.com

Abstract:

The paper was an analysis of 49 documents published on Mizo in India. They data retrieved from a health database PubMed, from the period 1991-2025. Ms Excel and Bibliometrix were used to analysed and processed the data. The study showed a high co-authorship per document 4.47 and very weak international co-authorship 2.041%. The most important journal was 'Environmental Science and Pollution Research International'; then 'Gene'. In normal counting Kumar NS and Pautu JL were the most productive authors; but in fractionalised counting, Lalchhandama K and Lalthanpuui PB became more productive. Mizoram University had collaborated the most with other institutions, especially with Mizoram State Cancer Institute and Civil Hospital, Mizoram. The study also had shown the increasingly awareness of breast cancer w.r.t Mizo society.

Keywords: Mizo, Bibliometrics, Authorships, Terms.

1. Introduction

India is home to many tribal peoples and one of the them is 'Mizo' community, who mostly settles in the Northeastern state of Mizoram (Bakhla et al., 2025) .It is said that literature is a mirror of the society. Therefore, understanding the academic publications on Mizo people would reflect the community past, presence and even likely predict its future path. Therefore, a quantitative study of academic outputs on Mizo, especially in the context of health and sickness is an imperative to identifying and finding the issues that challenge the community. The study will provide some lights on the literature published on Mizo in India. The study may also provide information on health issues that challenges Mizo community in the past and the presence.

2. Backgroud/ Past Studies

Citation package Bibliometrix is a very robust bibliometric tool (Zilnyk, 2011) to provide comprehensive tables and illustrative figures on nature of authorship, relevancy of research themes, institutional collaborations and so on tribal literature (Zilnyk, 2011; Yu et al., 2020) Results from bibliometric analysis can not only provide objective information about the quantity and quality of scientific research, but also facilitate health policy decisions, allocation of the health resources and further innovative studies(Wang et al., 2016).

Das et al., (2024) in their study on ethnomedicine outputs in India had identified important keywords. They were "In-Vitro", used 311 times; "Extract", used 194 times, "Medicinal-Plants", used 185 times. Another study by (Syukron, 2021) on indigenous community in Turkey identified that climate change, food security, indigenous knowledge, traditional ecological knowledge, and sustainable development were most used-keywords associated with sustainable livelihoods literature (Syukron, 2021) Similar study found that the number of articles published on tribalism had fluctuated over the years. Most frequently used keywords were 'brand tribalism', 'culture' and 'customer tribes' frequently used ,besides 'tribalism' (Hamamci & Aren, 2024).

Pathak & Bharati (2020) analysed publications available on 105 tribes of India. They found that the most studied tribe was Adi of Arunachal Pradesh (17 publications), followed by Kani tribe of Kerala (14 publications), Malayaii of Kerala (12 publications), Monpa of Arunachal Pradesh (11 publications), Korku of Madhya Pradesh (9 publications), amongst others. In term of country, a study by (Nath & Sahu, 2024) had identified South Africa that produced the greatest number of publications in the field of indigenous knowledge studies, followed by United States. On the other hand, India is ranked seventh among the leading nations that conduct research on the transfer, protection, and use of indigenous knowledge. An interesting study using keyword 'Mizo' in Scopus data base by (Shukla, 2023) had identified that publication growth in "Mizo" research and study observed 3.03 citations per paper and about 1/4 of the contributors belong to the Mizo community amongst the 164 total contributors.

3. Materials & Methods

Using the advanced search, the keyword 'Mizo' was entered in the 'search box' database PubMed. The search was refined by Title/Abstract'. The data range was 1991 to 2025. All together 49 results were retrieved from the database (as on 17th May, 2025). They were all selected and saved in PubMed file format. For data consistency, terms such as 'Mizo Tribe', 'Mizo Tribal Population' and 'Mizo Mongoloid Population' were represented as 'Mizo Population'. Similarly, the term 'North-east India' standardized from terms like 'Northeast', 'Northeast India'. This file was uploaded and opened in Bibliometrix software for generating relationships and associations amongst authors, organization, and terms' relevancy. The software was used to generate collaboration illustrative figures and table. The generated figures and tables were exported to MS Excel and MS word for further refining and processing.

Table 1 (below) showed the comprehensive details of the studied data. 49 documents from 41 types of sources were retrieved from the database. Annual Growth Rate of documents was 5.41 % and Document Average Age was 6.18. Very high co-authorship per document 4.47 and very weak international co-authorship at 2.041%. overwhelming 34 documents were published as journal article.

4. Results And Discussion

4.1 Main Information about the Data

Table 1: Main Information about Data

Description	Results
Main Information About Data	
Timespan	1991:2025
Sources (Journals, Books, etc)	41
Documents	49
Annual Growth Rate %	5.41
Document Average Age	6.18
Average citations per doc	0
References	0
Document Contents	
Keywords Plus (ID)	283
Author's Keywords (DE)	283
Authors	
Authors	167
Authors of single-authored docs	2
Authors Collaboration	
Single-authored docs	13
Co-Authors per Doc	4.47
International co-authorships %	2.041
Document Types	
Clinical Trial; Journal Article; Multicenter Study; Randomized Controlled Trial	1
Historical Article; Journal Article	1
Journal Article	34
Journal Article; Research Support, Non-U.S. Gov't	11
Journal Article; Review	2

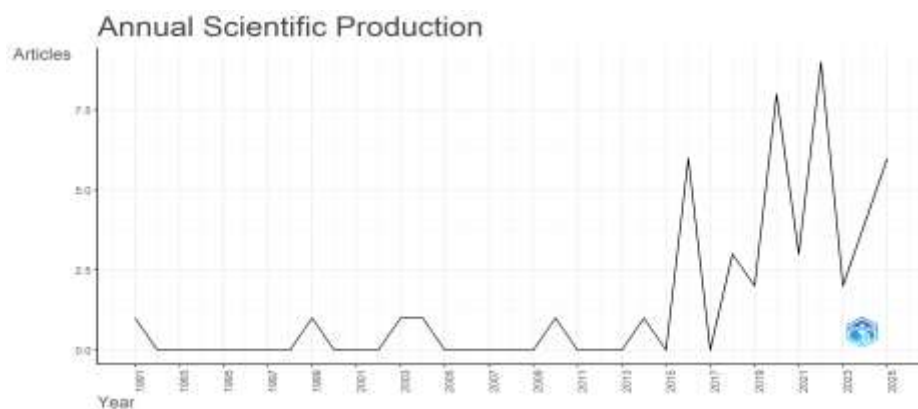


Figure 1: Annual production of Documents

From Figure 1, through the years there was ups and downs in the annual production of documents. However, the sudden spike in documents publications happened in the year 2015. Since 2019 there was comparatively steady greater documents produced.

4.2 Bradford's Zones of Core Sources

The table below was generated rank- and zone-wise. Most productive journals sources were categorised in Zone 1, moderately productive journals sources in Zone 2 and the least productive journals in Zone 3.

Table 2: Sources through Bradford's Law

SOURCES	Rank	Freq	Cum Freq	Zone
Environmental Science and Pollution Research International	1	4	4	Zone 1
Gene	2	3	7	Zone 1
Journal of Ethnobiology and Ethnomedicine	3	2	9	Zone 1
Mitochondrial DNA. Part A, DNA Mapping, Sequencing, and Analysis	3	2	11	Zone 1
Veterinary World	3	2	13	Zone 1
ACTA Histochemica	4	1	14	Zone 1
ACTA Pharmaceutica (Zagreb, Croatia)	4	1	15	Zone 1
American Journal of Clinical Oncology	4	1	16	Zone 1
American Journal of Human Biology: The official journal of the Human Biology Council	4	1	17	Zone 1
Annals of Medicine	4	1	18	Zone 2
Biochemical Genetics	4	1	19	Zone 2
BMC Complementary Medicine and Therapies	4	1	20	Zone 2
BMC Genomic Data	4	1	21	Zone 2
Bmc Public Health	4	1	22	Zone 2
Bmc Veterinary Research	4	1	23	Zone 2
Breast Cancer (Tokyo, Japan)	4	1	24	Zone 2
Breast Cancer Research and Treatment	4	1	25	Zone 2
Chronobiology International	4	1	26	Zone 2
Ejnm Physics	4	1	27	Zone 2
Environment and History	4	1	28	Zone 2
Forensic Science International	4	1	29	Zone 2
Frontiers in Public Health	4	1	30	Zone 2
Genes and Environment: The official journal of the Japanese Environmental Mutagen Society	4	1	31	Zone 2
Genomics	4	1	32	Zone 2
Gynecology and Obstetrics Clinical Medicine	4	1	33	Zone 2
Helicobacter	4	1	34	Zone 3
Heliyon	4	1	35	Zone 3

Journal of Ethnopharmacology	4	1	36	Zone 3
Journal of Health, Population, and Nutrition	4	1	37	Zone 3
Journal of the Medical Library Association: JMLA	4	1	38	Zone 3
Mitochondrion	4	1	39	Zone 3
Molecular Biology Reports	4	1	40	Zone 3
Open Veterinary Journal	4	1	41	Zone 3
Personalized Medicine	4	1	42	Zone 3
Pharmaceutical Biology	4	1	43	Zone 3
The Indian Journal of Medical Research	4	1	44	Zone 3
The Lancet Regional Health. Southeast Asia	4	1	45	Zone 3
Tropical Animal Health and Production	4	1	46	Zone 3
Tumour Biology: The journal of the International Society for Oncodevelopmental Biology and Medicine	4	1	47	Zone 3
Who South-East Asia Journal of Public Health	4	1	48	Zone 3
Zootaxa	4	1	49	Zone 3

From Table 2, there were 9 journals in Zone 1, 16 journals in Zone 2 and the majority 24 journals in Zone 3. The journal 'Environmental Science and Pollution Research International' ranked first was the productive source with 4 documents, 2nd productive journal was 'Gene' at 3 documents. At 3rd place, there were three journals 'Journal of Ethnobiology and Ethnomedicine', 'Mitochondrial DNA. Part A, DNA Mapping, Sequencing, and Analysis' and 'Veterinary World' with 2 documents each, respectively.

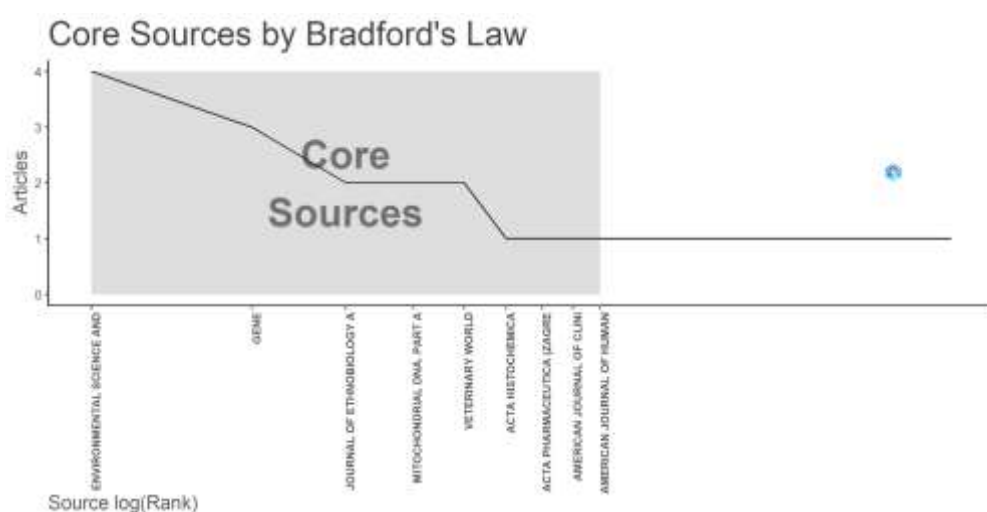


Figure 2: Core Sources by Bradford's Law

From figure 3, the graph showed a gradual declining of the line as it went along the x-axis indicating the decline of journals' productivity.

4.3 Most Relevant Authors

The table below listed 10 most productive authors from the study. Their publications were counted in both ways- normal counting and fractionalised counting.

Table 3: Most Relevant Authors

Authors	Articles	Articles Fractionalized
Kumar NS	12	1.75
Pautu JI	12	1.53
Ghatak S	10	1.36
Zohmingthanga J	10	1.49
Lalrohli F	8	1.33
Lalchhandama K	7	2.78
Lalthanpuui PB	7	2.78
Senthil Kumar N	6	0.86
Lallawmzuali D	5	0.74
Pachau L	5	0.57

Table 3, in normal counting, showed that Kumar NS and Pautu JL had produced the greatest number of articles at 12 each, but in fractionalised counting, they were not the most productive with values 1.75 and 1.53, respectively. The most productive authors in fractionalised counting with value 2.78 each were Lalchhandama K and Lalthanpuui PB, though they published only 7 articles each.

Table 4: Authors through Lotka's Law

Documents Written	N. of Authors	Proportion of Authors
1	128	0.766
2	18	0.108
3	5	0.03
4	6	0.036
5	2	0.012
6	1	0.006
7	2	0.012
8	1	0.006
10	2	0.012
12	2	0.012

Table 4 was distribution of authors prepared according to Lotka's Law. The huge majority 128 (76%) authors published one document each only. 18 (10%) authors had written 2 documents each. There were 1 author each with 6 and 8 documents, respectively. There were 2 authors each with the highest 10 and 12 documents produced, respectively.

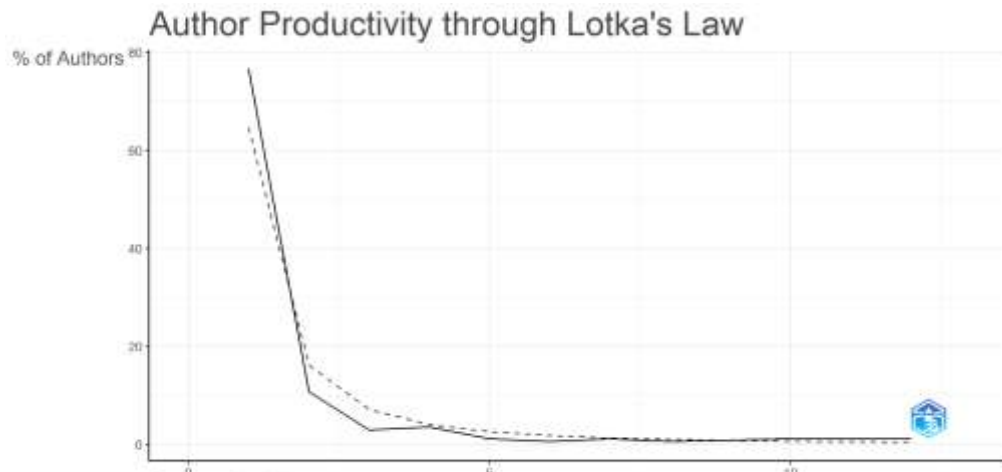


Figure 3: Author Productivity through Lotkas's Law

Seeing Figure 4, the authors data was almost in line with Lotka's law as one observed the thick line ran similar with the dotted line along the x-axis.

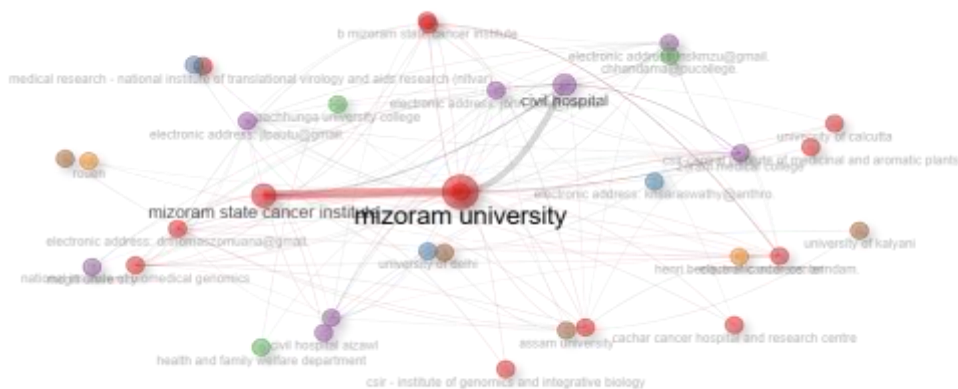


Figure 4: Institutional Affiliations

From Figure 6 it was clearly shown that authors from Mizoram University collaboration the most with other institutions, especially with Mizoram State Cancer Institute and Civil Hospital, Mizoram. The other institutions had fewer levels of collaborations between and amongst each other's.

4.4 Co-occurrence Words

The trigam-table was a list of three words/themes each. The number of co-occurrences signified their closeness amongst the themes.

Table 5: Title Most Co-occurrence Words

Words	Occurrences
Exome Sequencing Identifies	2
Risk Mizo-Population Northeast-India	2

Ace Id Gene	1
Adult Tobacco Survey-	1
Backyard Poultry Production	1
Bayesian Penalized Likelihood	1
Broad-Spectrum Anthelmintic Activity	1
Candidate Gene Polymorphisms	1
Cardiovascular Risk Factors	1
Cell Cycle Regulatory	1

Table 5 highlighted the most important themes 'Exome Sequencing Identifies' and 'Risk Mizo-Population Northeast-India' as they occurred twice each. Most words/themes were related with human body and its related health issues and treatments.



Figure 5: Title Word Cloud

Figure 5 vividly illustrated the frequency of words/themes by the size of the letters of the words/themes. Words like 'India', 'Mizoram', Northeast-India' were in much bigger letters indicating larger number of words occurrences.

Table 6: Title Word Dynamic

Year	Mizo	India	Northeast-India	Population	Gene	Mizoram	Study	Risk	Tribal	Breast Cancer
1999	1	1	0	0	0	0	0	0	0	0
2000	1	1	0	0	0	0	0	0	0	0
2001	1	1	0	0	0	0	0	0	0	0

2002	1	1	0	0	0	0	0	0	0	0
2003	1	1	0	1	0	0	0	0	1	0
2004	1	1	0	1	0	0	0	0	1	0
2005	1	1	0	1	0	0	0	0	1	0
2006	1	1	0	1	0	0	0	0	1	0
2007	1	1	0	1	0	0	0	0	1	0
2008	1	1	0	1	0	0	0	0	1	0
2009	1	1	0	1	0	0	0	0	1	0
2010	1	1	0	1	0	0	0	0	1	0
2011	1	1	0	1	0	0	0	0	1	0
2012	1	1	0	1	0	0	0	0	1	0
2013	1	1	0	1	0	0	0	0	1	0
2014	1	1	0	2	0	0	0	0	1	0
2015	1	1	0	2	0	0	0	0	1	0
2016	1	1	3	6	4	1	0	2	1	3
2017	1	1	3	6	4	1	0	2	1	3
2018	1	2	3	6	5	1	1	3	2	3
2019	1	3	3	6	5	1	1	4	3	3
2020	4	5	5	8	6	3	2	5	3	5
2021	7	6	7	10	8	3	3	6	3	5
2022	10	11	9	11	10	5	5	7	5	5
2023	11	13	9	12	10	6	6	7	5	5
2024	13	14	10	13	10	8	8	7	6	5
2025	17	15	13	13	10	10	8	7	7	6

Table 6 represented a chronological occurrence of most frequent terms generated from the titles of the documents. In the years 1999 and 2000, both terms 'Mizo' and 'India' began to appear. Then the terms 'Population' and 'Tribal' began to emerge in the year 2003. The year 2016 was a significant one as the terms 'Gene', 'Risk' and 'Breast Cancer' began to occur. Since the year 2020, the documents had shown a consistent focused on the terms 'Mizo', 'Gene', 'Risk' and 'Breast Cancer'.

5. Findings & Discussion

4.1 Table 1 showed a moderate Annual Growth Rate of documents of 5.41 % and Document Average Age was 6.18. Very high co-authorship per document 4.47 and very weak international co-authorship at 2.041%. overwhelming 34 documents were published as journal article.

4.2 Table 2 showed that the journal 'Environmental Science and Pollution Research International'; then 'Gene'; and then, 'Journal of Ethnobiology and

Ethnomedicine', 'Mitochondrial DNA. Part A, DNA Mapping, Sequencing, and Analysis' and 'Veterinary World'.

4.3 As shown by Table 3, in normal counting Kumar NS and Pautu JL were the most productive authors; but in fractionalised counting, Lalchhandama K and Lalthanpuui PB became more productive. It is heartening the most of the authors are Mizo themselves who had a firm background knowledge of the issues at hand.

4.4 The finding in Table 4 indicated that 76% authors published one document each only. From Figure 6 it was clearly shown that authors from Mizoram University collaboration the most with other institutions, especially with Mizoram State Cancer Institute and Civil Hospital, Mizoram. The other institutions had fewer levels of collaborations between and amongst each other's.

4.5 Also, the findings in Table 7 had shown the increasingly awareness of breast cancer w.r.t Mizo society. The year 2016 was a significant one as the terms 'Gene', 'Risk' and 'Breast Cancer' began to occur. Since the year 2020, the documents had shown a consistent focused on the terms 'Mizo', 'Gene', 'Risk' and 'Breast Cancer'.

6. Conclusions

It is said that literature is a mirror of the society, that is true for Mizo people as well. So, a quantitative study of academic outputs on Mizo, is an imperative to identifying and finding the issues that challenge the community. It is encouraging that the issues, for example cancers, was studied by Mizo scholars themselves, scholars like Pautu JL, Lalchhandama K, Lalthanpuui PB etc. Mizoram University collaboration the most with other institutions, especially with Mizoram State Cancer Institute and Civil Hospital, Mizoram. The study also had shown the increasingly awareness of breast cancer w.r.t Mizo society. The study can be further taken up qualitatively on the reasons why academic interest on issues like breast cancer have spiked since 2016.

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